INCH-POUND

MIL-R-39016/32E
4 August 1994
SUPERSEDING
MIL-R-39016/32D
20 July 1988

MILITARY SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, DPDT, LOW LEVEL TO 2 AMPERES (LATCHING)

Inactive for new design after 4 August 1994.

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and the issue of the following specification listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation: MIL-R-39016.

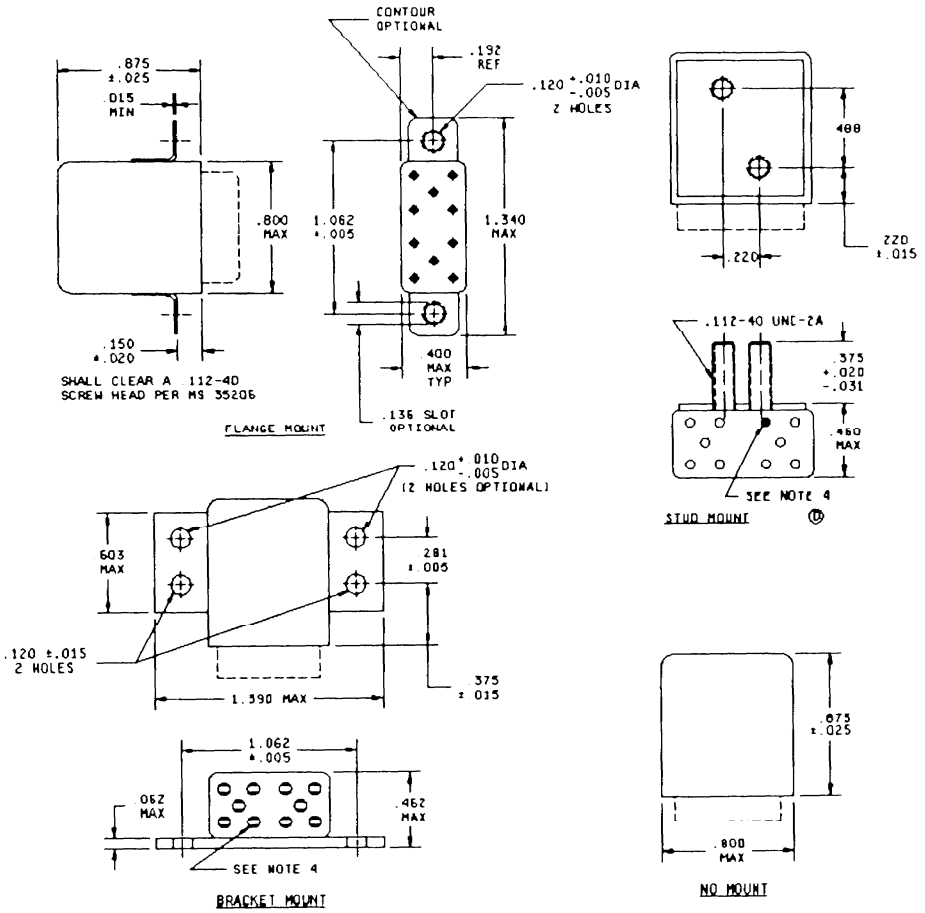
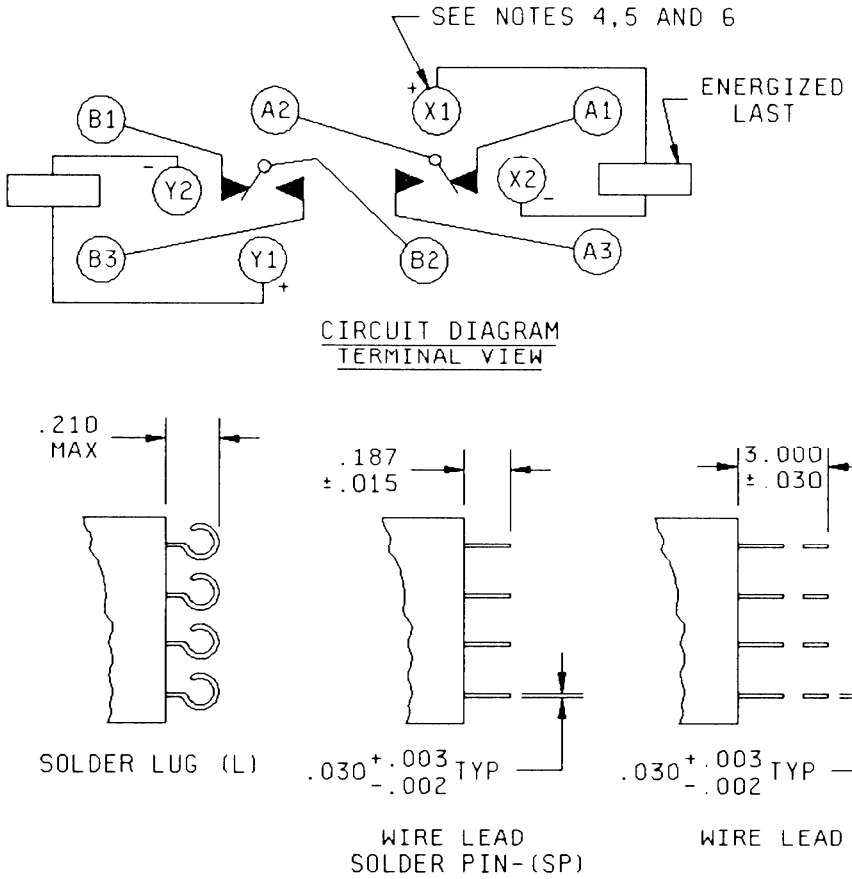


FIGURE 1. Dimensions and configurations.

(E) denotes changes



Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
.002	0.05	.030	0.76	.150	3.81	.375	9.52	.603	15.32
.003	0.08	.031	0.79	.187	4.75	.400	10.16	.800	20.32
.005	0.13	.062	1.57	.192	4.88	.460	11.68	.875	22.22
.010	0.25	.100	2.54	.200	5.08	.462	11.73	1.062	26.97
.015	0.38	.112	2.84	.210	5.33	.488	12.40	1.340	34.04
.020	0.51	.120	3.05	.220	5.59	.600	15.24	1.390	35.31
.025	0.64	.136	3.45	.281	7.14				

NOTES:
1. Dimensions are in inches.
2. Unless otherwise specified, tolerance is ±.010 (0.25 mm).
3. Metric equivalents are given for general information only.
4. Terminal indicated shall be identified by a contrasting bead. Relays shall have positive (+) and minus (-) signs placed on the circuit diagram as shown above.
5. Energizing the indicated coil with the indicated polarity and voltage shall cause the relay contacts to assume the position shown.
6. When relay enclosure has side mounting hardware, the contrasting header bead shall be located on the same side as the mounting hardware (bracket mount and stud mount).
7. Coil symbol optional in accordance with MIL-STD-1285.
8. Terminal numbers in circuit diagram are for reference only. Numbers do not appear on relay.

FIGURE 1. Dimensions and configurations - Continued.

REQUIREMENTS:

CONTACT DATA:

Arrangement: 2 form C.

Load ratings (relay case grounded):

High level:

Resistive: 2.0 amperes at 28 V dc; 0.15 ampere at 115 V ac, (60 Hz and 400 Hz).

Inductive: 0.8 ampere at 28 V dc (200 mH); 0.1 ampere at 115 V, 60 Hz and 400 Hz.

Lamp: 0.1 ampere at 28 V dc. 1/

Low level: 10 μA to 50 μA at 10 mV to 50 mV dc or peak ac.

Intermediate current: 50,000 cycles.

Contact resistance or voltage drop:

Initial: 0.050 ohm maximum.

High level:

During life: Maximum of 10 percent of open circuit voltage.

After life: 0.100 ohm maximum.

Low level:

During life: 50 ohms maximum.

After life: .150 ohm maximum.

Intermediate current:

During intermediate current: 1 ohm maximum.

After intermediate current: 0.300 ohm maximum.

Contact bounce: 1.5 ms maximum.

Contact stabilization time: 2.5 ms maximum.

Overload (high level only):

Resistive: Two times rated current.

Inductive: Two times rated current.

Neutral screen: Applicable.

1/ Contact resistance 3 ohms during and after life.

COIL DATA: (See table I.)

Duty rating: Continuous (one coil at a time).

Operate time (each coil): 5 ms maximum over temperature range.

Release time: Not applicable.

ELECTRICAL DATA:

Insulation resistance: 1,000 megohms minimum, except the resistance between coil and case at high temperature shall be 500 megohms or greater.

Dielectric withstanding voltage:

Sea level:

Between case, frame or enclosure, and all contacts	1,000 V rms (60 Hz).
Between case, frame or enclosure, and coil(s)	500 V rms (60 Hz).
Between all contacts and coils	1,000 V rms (60 Hz).
Between open contacts in the latch and reset positions	500 V rms (60 Hz).
Between coils	1,000 V rms (60 Hz).
Between contact poles	1,000 V rms (60 Hz).

Altitude:

Between all terminals to case	350 V rms (60 Hz).

ENVIRONMENTAL DATA:

Temperature range: -65°C to +125°C.

Magnetic interference: Not applicable.

Vibration (sinusoidal): Method 204, MIL-STD-202. Contact chatter shall not exceed 10 μs maximum for closed contacts and 1 μs maximum closure for open contacts.

Vibration (random): Method 214, MIL-STD-202, test condition IG. Contact chatter shall not exceed 10 μs maximum for closed contacts and 1 μs maximum closure for open contacts.

Shock (specified pulse): Method 213, MIL-STD-202, test condition C (100 g's). Contact chatter shall not exceed 10 μs maximum for closed contacts and 1 μs maximum closure for open contacts.

Coil life: Not applicable.

Resistance to soldering heat: Applicable.

Acceleration: Applicable.

PHYSICAL DATA:

Seal: Hermetic.

Terminals: See figure 1 and table I.

Terminal strength: 3 pounds ±0.3 pound (pull).

Solderability: Applicable.

Terminal twist test: Applicable to wire leads.

Dimensions and configurations: See figure 1 and table I.

Weight: 1 ounce maximum.

LIFE TEST REQUIREMENTS:

High level: 100,000 cycles.

Low level: 100,000 cycles.

PART OR IDENTIFYING NUMBER (PIN): M39016/32- (dash number from table I).

TABLE I. Dash numbers and characteristics. 1/

Dash number			Mount	Coil voltage (V dc) 2/		At +25°C		Over temperature range
Solder lug	Wire lead (SP)	Wire lead 3/		Rated	Max	Coil resistance ohms ±10%	Specified pickup (latch/reset) value (voltage) (V dc) 4/	Specified pickup (latch/reset) value (voltage) (V dc) 4/
001 002 003 005	 004 006	 019 022	Stud Bracket Flange No mount	26.5	32	975	12	18
007 008 009 011	 010 012	 020 	Stud Bracket Flange No mount	12	16	300	5.8	8.5
013 014 015 017	 016 018	 021 	Stud Bracket Flange No mount	6	8	82	3.0	4.2

1/ Relays previously tested or used above 10 mA resistive at 6 V dc maximum or peak ac open circuit shall not be used for low level applications.
2/ CAUTION: The use of any coil voltage less than the rated coil voltage will compromise the operation of the relay.
3/ CAUTION: When mounting relays with 3-inch wire leads, do not bend the leads within 0.20 inch of the relay header.
4/ Allow 20 percent increase in maximum operate values during and after rated life.

QUALIFICATION INSPECTION:

Qualification inspection and sample size: See table II.

TABLE II. Qualification inspection and sample size. 1/

Single submission	Group submission	
50 units plus 1 open unit. One failure allowed.	M39016/32-003	50 units plus 1 open unit. One failure allowed.
Qualification inspection as applicable.		Qualification inspection as applicable.
	M39016/32-016	Two units, qualification, group II, also shock, vibration, acceleration, terminal strength and seal.
	M39016/32-020	One unit terminal strength and solderability.

1/ The number of units required for qualification testing will be increased as required in group V, table II, MIL-R-39016, if the relay manufacturer elects to test the number of units permitting one or more failures. Prior to performance of qualification inspection testing, the relay manufacturer shall preselect the sampling plan.

SUPERSESSION DATA: See table III.

TABLE III. Supersession data.

Superseded PIN M5757/21-	New PIN M39016/32-
001	001
002	No replacement
003	002
004	019
005	003
006	004
007	001
008	No replacement
009	002
010	019
011	003
012	004

QUALITY ASSURANCE PROVISIONS:

Groups B and C not required. Group A required. The qualifying activity shall be notified of any design and/or construction changes and shall impose additional testing requirements as necessary.

CONCLUDING MATERIAL

Custodians:
Army - ER
Navy - EC
Air Force - 85

Review activities:
Army - AR, AT, AV, ME, MI
Navy - OS, SH
Air Force - 99

Preparing activity:
DLA - ES

(Project 5945-0947-01)